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October 27, 2004

Mr. Michael Martin
California Energy Commission
1516 Ninth St, Mail Station 4
Sacramento, Ca 95814-5512

Docket Number 04-AAER-1
Submitted by e-mail

Dear Mr. Martin:

Heatcraft Refrigeration Products LLC (Heatcraft), a division of Lennox International Inc., is a major manufacturer of refrigeration equipment marketed with the brand names of Bohn, Larkin, Chandler and Climate Control

The following comments are a reiteration and expansion of oral comments, offered by Jim Mullen for Heatcraft at the October 13, 2004 Workshop regarding the Title 20 45 day language. The comments are in reference to section 1605.3 (4); i.III & IV Energy Design Standards for Walk-in Refrigerators and Walk-in Freezers.

This section being addressed states:

(4) **Energy Design Standards for Walk-In Refrigerators and Walk-In Freezers.**

(i) **All Walk-in Refrigerators and Walk-in Freezers.** Walk-in refrigerators and walk-in freezers that are manufactured on or after January 1, 2006 shall have:

(III) either electronically commutated evaporator fan motors, evaporator fan motors of the same efficiency as electronically commutated evaporator fan motors, or evaporator fan controllers for shaded pole and other types of evaporator fan motors of similarly low efficiency; and

(IV) installed electronically commutated motors or other motor types of equivalent efficiency, for all self-contained compressor/condenser units that are dedicated to the walk-in cabinet, including but not limited to remote compressor/condenser units.

As written, this requirement would include literally hundreds of Heatcraft models utilizing numerous evaporator and condenser fan motors of designs with power outputs in the range of 1/150 to 5 horsepower (hp), operating on 115, 208, 230, and 460 Volts, single and 3 phase AC electrical supplies.

We reiterate our workshop request that these provisions be removed from this code cycle and that future proposals be delayed until such time as the following issues can be adequately addressed.

1. Non availability of many electronically commutated motors (ECM)
   In response to the publication of the draft requirements, dated May 12, 2004 we commented on the non-availability of ECM motors on June 23, 2004 (docket 03-AAER-1). In the interim period, Heatcraft and Lennox International engineering and purchasing personnel have been, and continue to, actively search for sources for ECM motors to meet this requirement. Several substantial issues have been identified:
   - To date, sources of supply for much less than half the ECM motors required have been located and sampling of available motors started. The lack of motors is not a simple issue, it exists in the majority of the matrix of frame sizes, power requirements, voltages and phases necessary for our product lines.
   - Most of the motor sources located are single sources, i.e. the regulation will essentially mandate the company that we, and our competitors, must purchase motors from. In addition to the monopoly this could create, it also may lead to continuing equipment supply and availability issues.
   - As a customer, Heatcraft, and our competitors, can only request motor manufacturers to design, develop, produce and market the nonexistent motors. The decision is entirely in the motor manufacturer's purveyance. Until they develop and produce motors, we cannot begin the internal processes of testing, evaluation, agency certification and manufacturing implementation required providing products for sale that conform to these Title 20 requirements. The process of launching products with ECM motors where they do not exist today can reasonably be expected to take several years, and the process only begins if a motor manufacturer decides to produce and sell motors.
2. The ECM or equivalent specification is an inadequate standard.
   As specified, this requirement is prescriptive for a type of motor (ECM) that is assumed to have a minimum efficiency level. However, no standard exists defining the efficiency level of ECM motors. A few examples of the problems this could create:
   - As written, if an ECM motor exists, it, or an equivalent can be used, regardless of whether the efficiency is 20% or 80%. There is no guarantee of cost effective savings as claimed in the technical analysis for this requirement.
   - It is doubtful that ECM motors will ever exist, or even theoretically be the most cost effective choice for high voltage and three phase applications

   To move this regulation forward, it needs to be redrafted to be performance based with minimum efficiencies specified.
3. The technical analysis supporting this requirement is fatally flawed.
   - Since the majority of covered motors do not exist, and no standard defines the efficiency for the motors that do not exist, there is no firm data available underlying the motor cost and efficiency assumptions used to justify this regulation. The eight-year-old data defining efficiency and cost selected from the 1996 ADL report[i], Table 5-2, are clearly stated as estimates based on discussions with motor manufacturers. Current information, based on actual motors, differs substantially from information in the table, suggesting the data for motors that do not exist is also inaccurate.

- The 1996 ADL report which serves as the basis of the technical justification appears to contain errors and overstatement of the fan power consumption, and needs a thorough review and correction or reaffirmation before being
- accepted as the justification for this requirement. Equipment for the display cooler analyzed would more likely be rated at 2.5 hp, not 5 hp, the report claims to save 192 watts on the freezer evaporator fans when the original shaded pole consumption was only 180 watts, and the condenser fan power in the analysis far exceeds that of today's equipment (2@ ½ hp fans in the report vs. 1 @ 1/3 hp in a typical 5 hp Bohn condensing unit).
- The technical analysis appears to be based on an assumption that 100% of the motor(s) will last the life of the equipment (10 years) and that the ECM motors and associated electronics also have a zero replacement rate, equivalent to the current motors. This is incorrect and the cost benefit analysis should be adjusted to represent a reasonable replacement expense factor.
- The technical analysis also appears to be predicated on the basis that all motors currently are shaded pole, and the energy savings calculated from that high-energy consumption base. In fact, many of the motors that would be covered by this regulation are currently higher efficiency Permanent Split Capacitor (PSC) and integral horsepower motors with efficiencies 2 to 4 times higher than the assumed base. This substantially reduces the cost savings used to justify the regulation and should be corrected in the analysis.

4. <u>Lack of readily available repair motors issue</u>

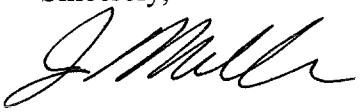
   Repair trucks and service centers do not currently carry a stock of the ECM motors that do exist. Unless an infrastructure of readily available repair parts is in place when this regulation takes affect, the risk of public health and safety issues from improperly stored food is increased.

At the workshop, we were asked whether or not a PSC motor standard would be better than the 45-day language. After reviewing the issues in detail, our response is that it is only slightly better, but still less than adequate, for the following reasons:

- Again, this is a prescriptive rather than performance base standard and as such, carries many associated problems. For example:
  - There is no standard defining PSC motor efficiency
  - PSC motors don't exist for all applications.
  - PSC motors may be a less efficient alternative than motors now being used.

Heatcraft and Lennox look forward to working with CEC and it's contractors regarding this regulation. If you have questions, or need further information, please contact me.

Sincerely,



Jim Mullen
Director of Technology Services

CC Karim Amrane--ARI
Robert Del Ventura--Heatcraft
Dave Lewis--Lennox

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[i] Energy Savings Potential for Commercial Refrigeration Equipment; Final Report prepared by Arthur D. Little, Inc.;June, 1996;Westphalen, et. Al.